APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,071	04/20/2001	Rajendra Kumar Bera	JP910000183US1	2724

7590 04/22/2004	EXAMINER
International Business Machines Corporation Almaden Research Center 650 Harry Road San Jose, CA 95120	TANG, KUO LIANG J

ART UNIT	PAPER NUMBER
2122	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/839,071	BERA, RAJENDRA KUMAR
	Examiner	Art Unit
	Kuo-Liang J Tang	2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *20 April 2001*.
2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-7* is/are pending in the application.
   4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *1-7* is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. _____.
    3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-7 are pending and have been examined. The priority date for this application is 04/20/2001.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beaumont et

al., US Patent No. 6,654,953 (hereinafter Beaumont) in view of Horiguchi et al, US Patent No.

08/203,728 (hereinafter Horiguchi) further in view of Shaughnessy, US Patent No. 6,026,235,

further in view of Sreedhar et al., US Patent No. 6,182,284 (hereinafter Sreedhar).

As Per Claim 1, Beaumont teaches that attribute tags embedded in the statements of a

source program system extend a programming language. (E.g. see Abstract and associated text).

In that Beaumont discloses the method that covering the steps :

"(a) forming, for each block of assignment statements, a corresponding array (E.g. see

FIG. 4 block 415 and associated text), each array comprising a plurality of elements

corresponding to respective ones of the statements and populating the elements with attributes

(E.g. see FIG. 4 block 220 and associated text) of the statements including the expression at the

right-hand side of the statement;" (E.g. see FIG. 5 blocks 550 and associated text);

"(b) processing, in each array, each assignment statement in turn (E.g. see FIG. 5 block

551 and associated text), the processing comprising the inspection of each unprocessed

assignment statement in turn, in the order from the last unprocessed assignment statement to the

first, to determine if the variable appearing on the left-hand side of the unprocessed assignment

statement appears on the right-hand side of the assignment statement being processed;" (E.g. see

FIG. 5 block 553, 556 and associated text). Beaumont does not explicitly discloses the processed

order is from the last statement to the first. Horiguchi, however in an analogous art, discloses

processed order is from the last statement to the first (E.g. see Horiguchi art col. 15:33-40,

LIFO). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

invention was made to incorporate the teaching of Horiguchi into the system of Beaumont, to

process in the order from the last statement to the first using stack frame. The modification

would have been obvious because one of ordinary skill in the art would have been motivated to

determine which LSH to be executed when specified conditions occur with the order list.

"(c) during step (b), in each array, if the variable appearing on the left-hand side of the

unprocessed assignment statement also appears on the right-hand side of the assignment

statement being processed, replacing all occurrences of such variable on the right-hand side of

the assignment statement being processed, non-recursively, by the right-hand side of the said

unprocessed assignment statement;" (E.g. see Beaumont art FIG. 5 block 561 and associated

text);

"(d) forming, from each array, a corresponding new block of assignment statements

comprising the statements processed according to steps (b) and (c) less any statements which,

after processing, is either an identity (the left and right sides of the statement are identical) or

whose left-hand side variable is not one of the output variables" (E.g. see Beaumont art FIG. 5

block 580 and associated text);

"(e) creating, from each new block of assignment statements, a corresponding new array,

each array comprising a plurality of elements corresponding to respective ones of the statements

and populating the elements with attributes of the statements including the expression at the

right-hand side of the statement;" (E.g. see Beaumont art FIG. 4 block 415 and associated text);

The combination of Beaumont and Horiguchi do not disclose sorting, in each new array,

the array elements in alphabetical order using the output variable name as the key. Shaughnessy,

however in an analogous art, discloses "(f) sorting, in each new array, the array elements in

alphabetical order using the output variable name as the key." (E.g. see Shaughnessy art FIG. 3

step 301 and associated text, e.g. col. 10:25-27). Therefore, it would have been obvious to one

of ordinary skill in the art at the time the invention was made to incorporate the teaching of

Shaughnessy into the system of Beaumont as modified by Horiguchi, to sort the array by name.

The modification would have been obvious because one of ordinary skill in the art would have

been motivated to allow fast binary searching by address or by name.

The combination of Beaumont, Horiguchi and Shaughnessy do not disclose comparing

the arrays to detect the equivalence of two blocks of assignment statements. Sreedhar, however

in an analogous art, discloses "(g) comparing the arrays to detect the equivalence of two blocks

of assignment statements." (E.g. see Sreedhar art, FIG. 21D, 24A, 25D and associated text, e.g.

col. 38:25-27). Therefore, it would have been obvious to one of ordinary skill in the art at the

time the invention was made to incorporate the teaching of Sreedhar into the system of

Beaumont, Horiguchi and Shaughnessy, to detect the equivalence of two blocks of assignment

statements. The modification would have been obvious because one of ordinary skill in the art

would have been motivated to validate the various intermediate-level codes during the

optimization phases.

As Per claim 2, the rejection of claim 1 is incorporated and further Beaumont teaches:

"for each assignment statement in a block, testing the statement for compliance with

predetermined rules concerning the applicability of steps (b) and (c), and, if said rules are not

complied with, abandoning the method with an error message.". Official notice is taken that this

limitation is inherent in Beaumont's system (E.g. see FIG. 4 compiler backend 416 and object

code 420 and associated text) because when in order to generate the object code, the code must

have been compiled. If the code is not compiled, the program is stopped (abandoning) and an

error message will be generated as well by the compiler.

As Per claim 3, the rejection of claim 1 is incorporated and further Beaumont teaches:

"whereby Step (a) is preceded by a formatting step of the right-hand side of each

assignment statement according to predetermined rules." (E.g. see FIG. 5 blocks 550 and block

565 and associated text).

As Per claim 4, the rejection of claim 1 is incorporated and further Beaumont teaches:

"whereby in Step (d) the right-hand side of each included assignment statement is

formatted according to predetermined rules." (E.g. see FIG. 5 blocks 550 and block 565 and

associated text).

As Per claim 5, the rejection of claim 1 is incorporated and further Beaumont teaches:

"whereby at the conclusion of Step (e) if the number of assignment statements is not

equal to the number of output variables, abandoning the method with an error message." (E.g.

see FIG. 5 line 564 and associated text).

As Per Claim 6, is the apparatus claim corresponding to the method claim 1 and is

rejected under the same reason set forth in connection of the rejection of claim 1.

As Per Claim 7, is the computer program product claim corresponding to the method

claim 1 and is rejected under the same reason set forth in connection of the rejection of claim 1.

Conclusion

3.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Kuo-Liang J Tang whose telephone number is 703-305-4866.

The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Tuan Q Dam can be reached on 703-305-4552.

Any response to this action should be mailed to:

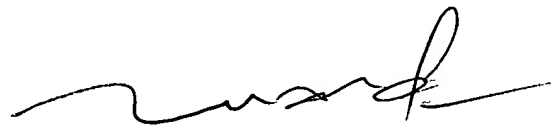Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306.

TUAN DAM
SUPERVISORY PATENT EXAMINER

Kuo-Liang J. Tang

Software Engineer Patent Examiner